

**PREVALENCE OF ASTHMA AND ALLERGIC RHINITIS**  
**AMONG 12-14 YEARS OLD SCHOOL CHILDREN**  
**RESIDING IN VELLORE, SOUTH INDIA**

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
RULES AND REGULATIONS FOR THE MD, PAEDIATRICS DEGREE  
EXAMINATION OF THE TAMIL NADU DR.M.G.R MEDICAL UNIVERSITY  
TO BE HELD IN APRIL 2013.

## **CERTIFICATE**

This is to certify that the dissertation entitled "**Prevalence of Asthma and Allergic rhinitis among 12-14 years old school children residing in Vellore, South India**" is the bonafide original work of **Dr. Sethuraju Gunawathi** towards the MD branch, Paediatrics Degree Examination of The Tamil Nadu Dr. M.G.R Medical University, Chennai to be held in April 2013.

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## ANTI PLAGIARISM SCREEN SHOT

The screenshot displays the Turnitin Document Viewer interface within a Mozilla Firefox browser. The document being reviewed is titled "PREVALENCE OF ASTHMA AND ALLERGIC RHINITIS IN 12-14 YEARS OF" by SETHURAJU GUNAWATHI, dated 20113155. The interface shows a "Match Overview" sidebar on the right, indicating a 13% similarity score. The main text area displays the "INTRODUCTION" section of the document, with two paragraphs. The first paragraph discusses asthma as a chronic inflammatory condition. The second paragraph discusses the prevalence of asthma in children in India. The sidebar lists eight matches with their respective similarity percentages.

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6	FUSO, L. "Repeatabili... Publication	1%
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8	findarticles.com Internet source	1%

**INTRODUCTION**

<sup>11</sup> Asthma is a chronic inflammatory condition of the lung airways resulting in episodic airflow obstruction. This chronic inflammation heightens the "twitchiness" of the airways—airways hyper responsiveness (AHR)—to provocative exposures<sup>(1)</sup>.

<sup>14</sup> The prevalence of asthma in children is underestimated in India. It has varied from 1% to 29.5% depending on the population studied (2-10). It has been observed that there is rising trend of asthma in children over past few decades<sup>(11)</sup>. This has been attributed to change in life style, urbanization and industrialization.

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# **INTRODUCTION**

## **INTRODUCTION**

Asthma is a chronic inflammatory condition of the lung airways resulting in episodic airflow obstruction. This chronic inflammation heightens the “twitchiness” of the airways—airways hyper responsiveness (AHR)—to provocative exposures (1).

The prevalence of asthma in children is underestimated in India. It has varied from 1% to 29.5% depending on the population studied (2-10). It has been observed that there is rising trend of asthma in children over past few decades(11). This has been attributed to change in life style, urbanization and industrialization.

Many cases of childhood asthma are not diagnosed in the community due to various factors like ignorance, misconceptions and poor awareness among even medical practitioners. With the availability of relatively cheap preventer medications, asthma can be effectively controlled in many of these children.

To date there has been no study to assess the prevalence of asthma among the children in Vellore. This information is vital for understanding the magnitude of the problem and planning strategies to improve awareness and health seeking behavior in the community.

Allergic rhinitis (AR) is an inflammatory disorder of the nasal mucosa characterized by nasal congestion, rhinorrhea, and itching, often accompanied by sneezing and conjunctival irritation. Childhood allergic rhinitis is associated with at least twofold increase in risk for asthma at an older age(1). It has been observed that there is an increasing trend in the prevalence in allergic rhinitis. Allergic rhinitis adversely affects the patient's quality of life.

This condition is grossly underestimated in our population, hence prevalence studies are important.

# **LITERATURE REVIEW**

## **LITERATURE REVIEW**

Worldwide childhood asthma is one of the leading causes of morbidity in children. It is a chronic condition characterized by episodic cough, wheezing, chest tightness and difficulty in breathing. Any one or more of the above symptoms occur when exposed to several stimuli. These are referred to as triggers. Triggers include viral illnesses such as common cold, exposure to pollen, and certain food items to which child is allergic to, physical activities and environmental conditions.

During the episodes of asthma, there is partial or complete narrowing of the airways which resolves either spontaneously or in response to treatment.

## **RISK FACTORS AND ASTHMA PREDICTIVE INDEX**

Asthma is believed to result from complex interactions between multiple environmental and genetic influences. Several risk factors for asthma have been identified. The best studied risk factors are gender(12)(13), airway hyperresponsiveness, atopy, allergens, infections, tobacco smoke(5), (14), obesity, prenatal factors(15)(16) and birth order(17).

The Asthma Predictive Index (API) as per The 2007 National Heart, Lung and Blood Institute (NHLBI) Guidelines for the Diagnosis and Management of Asthma, enables us to determine, who among the preschool wheezers will possibly have asthma in later years.



It includes

Major criteria

- Parental asthma
- Diagnosis of atopic dermatitis by physician
- Sensitization to inhaled allergens such as positive skin tests or blood tests to allergens such as trees, grasses, weeds, molds, or dust mites

Minor criteria:

- Evidence of food allergies
- Blood eosinophilia of 4 percent or more and
- Wheezing apart from colds

Presence of one major criteria or 2 minor criteria suggests high risk for persistence of asthma. A study done by Jose A. Castro-Rodriguez throws light on applicability, validity and simplicity of this criteria (18).

## **MANAGEMENT OF ASTHMA**

There are many guidelines with respect to management of asthma in children. The most widely used is the one by “Global Initiative for Asthma (GINA)”. This initiative publishes guidelines based on new evidences for the diagnosis and management of asthma in children.

GINA guideline recommends the classification of asthma by level of control:

- Controlled
- Partly controlled
- Un controlled

Other guidelines are the PRACTALL Consensus Report published by the European Academy of Asthma and Allergy in 2008 (19), the EPR3 of the National Asthma Education Programme (NAEPP) (20), and an Evidence Based Approach compiled by the European Respiratory Society task force, published in the European Respiratory Journal in 2008(21).

According to The National Asthma Education and Prevention Program's Expert Panel Report 3 (EPR3) the management of asthma has following components:

- (1) Periodic assessment and monitoring of disease activity.
- (2) Integration of self management education and provide education to the patient's and family's knowledge about asthma care.
- (3) Identification and management of aggravating factors and co-morbid conditions that may precipitate the symptoms of asthma
- (4) Selection of appropriate medications as per the patient's needs.

While bronchodilators on as needed basis for intermittent asthma, preventer medications are needed for persistent asthma, inhaled corticosteroids treatment is the mainstay of asthma symptom control. While there is consensus on use of inhaled steroids for persistent asthma in children of school age, it's exact role for different phenotypes of wheeze in children under five is controversial.

Guidelines and recommendations help medical professional to optimize management of asthma in children, provide good control of symptoms and improve quality of their life. But there exists controversies regarding etiology of asthma, methods for prevalence estimation and use of various treatment options in younger children. Huge amount of research has been done in an attempt to provide answers to these questions.

## **IMPORTANCE OF PREVALENCE STUDIES**

It is important to know the prevalence of any condition in the given population or community. This helps us to understand the magnitude of the problem at one point of time and follow trends over a period of time. Information on changes in prevalence rates is important to plan for provision of services and to predict the demand on service providers for treatment. A rising trend in prevalence or mortality from the condition warrants intensification of efforts to control the problem. Clues to etiological factors can be obtained only if trends in prevalence of the condition are known.

With regards to childhood asthma all of the above are true. Information from the prevalence studies conducted world over has immensely contributed to the progress in the knowledge of etiological factors and optimal management strategies of childhood asthma.

## **METHODS OF PREVALENCE STUDY**

There are different ways to estimate prevalence of asthma. Surveys using questionnaires, monitoring of usage of drugs for asthma in the community, asthma registries, audit of health care facility usage are some of the methods. For small samples, evaluation by physician, bronchoprovocative tests(22) etc can be used.

However, surveys using questionnaire is one of the simplest and cost effective methods. A large population can be covered in a short time, but the results obtained need not be accurate. There is a tendency to overestimate or sometimes underestimate the problem(23). Response to the questions can be affected by the respondent's age, educational background and familiarity with the use of questionnaires. Communication skills of the person administering the questionnaire also may play a role.

The important factor is unfamiliarity with the terms used. Subjects may not be familiar with the word "wheeze", especially when translated to local language. In many languages there is no equivalent term for "wheeze". It has been shown that there is poor correlation between parent's concept of wheeze (in their children) and physician's diagnosis of wheeze(24). If that is the case with adults, children's reporting of wheeze could be unreliable.

Another difficulty is that even if a diagnosis of asthma has already been made by the physician, it may not be conveyed to the child. Sometimes another word like "bronchitis" substitutes the diagnosis of asthma.

It has been found that there is poor correlation(25) when asthma prevalence is assessed by different methods.

These limitations are accepted across the world. However surveys using questionnaire remains the most widely used method.

There are many questionnaires in use to estimate prevalence of asthma. Standard European Community Respiratory Health Survey (ECRHS) (21), International Union Against Tuberculosis and Lung Diseases (IUATLD) respiratory symptoms questionnaire(26), Tasmanian Asthma survey (TAS) (27) are some of the questionnaires used in adults.

In children, questionnaire developed by International Study of asthma and allergies in Children (ISAAC) is the most widely accepted and used.



## **INTERNATIONAL STUDY OF ASTHMA AND ALLERGY IN CHILDHOOD**

The International Study Of Asthma and allergy in Childhood (ISAAC) was founded for the epidemiological research into asthma and allergic disease by developing standardized methodology(28). Merging of two multinational projects one from Auckland, Newzeland and another from Germany have lead to development of ISAAC.

This project was launched in 1990 and invited participants from all over the world. Many developed and developing nations participated in this project. The data obtained from this study is the most quoted reference for asthma prevalence in children.

ISSAC consisted of three phases. They are as follows:

Phase 1: To assess the prevalence and severity of asthma, allergic rhinitis and eczema in defined population using core questionnaire.

Phase 2: To find out etiological factors based on Phase 1 findings.

Phase 3: To assess the trend in prevalence by repetition of Phase 1.

## **ISAAC QUESTIONNAIRE**

The ISSAC questionnaire for asthma consists of eight questions pertaining to the symptoms of asthma (like nocturnal cough and exercise induced wheeze), severity and physician diagnosis of asthma (see Annexure 4).

English version of the ISSAC phase 1 questionnaire is freely available for non ISAAC researchers. Translation into local language has been done including Indian languages following guidelines prescribed in ISSAC manual(28). Special care is needed in translation and validation. This questionnaire has been modified in some settings to accommodate for specific needs of the area. If that is done, interpretation of the additional questions will need further verification and validation.

Jenkins et al (29) reported the results of a study done on 361 children in which ISAAC questionnaire was validated against bronchial hyper responsiveness and physician assessment .Physician assessment was considered the gold standard in this study. For the ISAAC questionnaire positive predictive value was 0.61 (CI 0.50-0.71) and negative predictive value was 0.94(CI 0.88-0.98). Sensitivity was 0.85 and specificity 0.81. Hence the authors concluded that ISSAC questionnaire was valid tool for estimating symptoms of asthma in past 12 months.

It has been found that, an affirmative answer to the question "Have you had wheezing or whistling in the chest in last 12 months" in the ISSAC written questionnaire corresponds to a diagnosis of asthma(30). A study on Brazilian school children using ISSAC questionnaire showed that wheezing within the last 12 months and overall asthma score are the best criteria for diagnosis of asthma when ISAAC questionnaire is used(31).

ISSAC study design has tremendously helped in documentation of information and comparison of prevalence of asthma and allergic diseases particularly allergic rhinitis and eczema across the world, among the countries, states and regions.

## **VIDEO QUESTIONNAIRE**

To overcome some of the limitations in written questionnaire, a video of asthma symptoms was developed by the Wellington Asthma Research Group. This video questionnaire (AVQ 3.0) for asthma comprises of five scenes i.e wheezing, nocturnal wheeze, nocturnal cough, exercise induced wheeze and severe asthma. This video has been recommended for the 13-14 year age group and has been validated (32-36).

A study by Fuso et al (37) showed that the repeatability of video questionnaire was similar to that of the written questionnaire for items on exercise wheeze and nocturnal cough and, to a lesser degree, for items concerning any wheeze in the past. The video questionnaire showed a worse performance than the written questionnaire for items on asthma attack.

The video questionnaire has been also validated against demonstration of bronchial hyper-responsiveness(32)

It was found that the degree of agreement between responses to the two corresponding questions "wheezing " and "nocturnal wheeze" in the video questionnaire and written questionnaire were moderate and weak with Kappa indices of 0.45 and 0.23, respectively(38).

An interesting study was done by Van Sickle in Chennai India, where physicians were shown the video questionnaire. Ability to identify the scenes as asthma symptoms was as low as 26% for some scenes and 67% in others(39).

In a semirural area of Chile, a study was done on young adults to assess the level of agreement between responses to the European Community Respiratory Health Survey (ECRHS) questionnaire and responses after demonstration of asthma symptoms based on the video developed in ISAAC. There was lower prevalence of asthma symptoms after demonstration of symptoms. (40).

The reason for low reporting of symptoms when video questionnaire is used could be because the adolescents do not identify with the dramatic way in which the symptoms are pictured in video sequences.

Despite the shortcomings, Video questionnaire have been widely used in many prevalence studies.

## **PREVALENCE OF ASTHMA**

### **WORLDWIDE**

A wide variation in prevalence rates has been documented across the globe. The studies of both children and adults have revealed low prevalence rates in Asian countries about 2-4% (especially China and India) and high prevalence rates of 15%–20% in developed countries like the United Kingdom, Canada, Australia, New Zealand and other developed countries(11). The highest Asthma prevalence rates are found in the United Kingdom (>15%) and New Zealand (15.1%).

## **INDIA**

In India, the studies done in North have reported a prevalence rate of 11.9% among Delhi school children by Chhabra(4) and 1% in rural children in Punjab. Gupta et al found respiratory symptoms were reported by 31% of 9-20 year old children, but observed asthma prevalence was 2.6% for boys and 1.9% in girls in Chandigarh(5). The prevalence of asthma was 2.3% in 6-7 years and 3.3 % in 13-14 years with weighted asthma prevalence of 2.8% in Lucknow by Awasthi(6). The children with current wheeze in a study done in Jaipur was 8.4%(41).

In South India, a study by Parmesh showed prevalence rate of 29.5% in 1999 in Bangalore(7). In Tamil Nadu, the overall prevalence of difficulty of breathing difficulty was 18% and prevalence of diagnosed asthma was 5% in a study by Chakravaty(8).

Recently published article by Ganesh Kumar, the overall prevalence of asthma among school children in rural Puducherry was 8.7%(42).



## **ASTHMA PREVALENCE TRENDS**

Recently published report by CDC states that asthma prevalence in USA has increased from 7.3% in 2001 to 8.4% in 2010(43).

Though Prevalence of asthma in children showed an increasing trend , it has levelled off at least in countries where high prevalence existed before as has been demonstrated in ISAAC phase 3 results(11).

In Norway during a 10 year period from 1985 asthma prevalence doubled and over next 13 years till 2008 it tripled(44).

According to CDC report from USA compared with adults, children had more primary care visits and ED visits but lower death rates from 2001-2010(43). In contrast Australia reported a rise by more than double, in asthma deaths among children since 2006(45).

## **IN INDIA**

The persistent asthma also showed an increase from 20% to 27.5% and persistent severe asthma 4% to 6.5% between 1994-99 in Bangalore by a study by Parmesh (7).

## **CORRELATION BETWEEN DEMOGRAPHIC FACTORS, RISK FACTORS AND PREVALENCE OF ASTHMA**

There are many studies which have identified risk factors for development of asthma.

In most studies a positive family history of asthma strongly correlates. Asthma and allergic disease have strong genetic influence in their development(46)(47). Certain environmental risk factors like exposure to diesel fumes and cigarette smoke have shown association with higher risk of asthma development(5)(48). However, inspite of tremendous amount of research in this area, conclusive evidence is not yet available to show which factors are contributory and which are protective in the development of asthma.

Urbanisation, industrialization, and change in lifestyle have been implicated in rising trends in asthma prevalence in children. Whether in rural or urban India the overall prevalence is above 4% suggesting a significant burden of disease in the country. The children affected have irregular attendance in school leading to poor academic achievement. The physical and social developments are also impaired. These children are unable to participate in dance, sports or other outdoor activities. It also leads to significant stress in the family concerning frequent visits to hospitals, cost of treatment and school absenteeism.

## **ALLERGIC RHINITIS**

Allergic rhinitis is a common inflammatory disease condition of upper respiratory tract. Allergic rhinitis is the most frequent allergic disorders among the children.

## **CLASSIFICATION OF ALLERGIC RHINITIS**

Earlier allergic rhinitis was classified as “seasonal” or “perennial”, now ,the new classification is based on the duration of symptoms as “persistent” or “intermittent” along with severity of symptoms as “mild” or “moderate-severe” according to ARIA (Allergic Rhinitis & its Impact on Asthma) guidelines(49).

## **PREVALENCE OF ALLERGIC RHINITIS**

ISAAC Study which used a standardized epidemiological method to survey the prevalence of allergic rhinitis in over 460,000 children aged 13-14 years from 155 centres in 56 countries worldwide showed that the prevalence varies from 1.4% to 39.7% worldwide. The lowest prevalences are found in parts of Eastern Europe, south and central Asia. High prevalences are reported from centres in several regions, including Canada, Australia, New Zealand, the United States and the United Kingdom. The overall mean prevalence is 13.9% and nearly half of those studied had concomitant asthma or eczema. Areas with a low prevalence of rhinitis tended also to have a low prevalence of asthma and eczema(50).

The prevalence is reported to range from 10-13% in Delhi state of North India. Also, symptoms of rhinitis are reported in 75% of children and 80% of asthmatic adults in India(49).

## **FACTORS AFFECTING ALLERGIC RHINITIS**

There is substantial evidence of a rise in the prevalence of allergic diseases, including rhinitis, over recent decades. Lifestyle factors may be important given the high prevalence of rhinitis and other allergic diseases found in westernized English-speaking countries.

In fact, allergic rhinitis, affecting the children is often under diagnosed by the treating physician.

Its symptoms are troublesome affecting school performance and socialization. Allergic rhinitis should not be considered a minor disease. It does affect socially, economically and psychologically. Hence, there a need to recognise symptoms of allergic rhinitis by the physicians and treat appropriately in order to improve the quality of life.

There are several studies where there is co-existence of allergic rhinitis and asthma(51).

## **MANAGEMENT OF ALLERGIC RHINITIS**

In the management of allergic rhinitis, second generation oral anti H1 blocker is the mainstay for the treatment of mild to moderate allergic rhinitis orally, intranasally or topically. Intranasal corticosteroids are considered to be a first line therapeutic option for the management of moderate as well as persistent allergic rhinitis. Other drugs include decongestants, mast-cell stabilizers, leukotriene receptor antagonists, anti-cholinergic agents in oral or topical nasal formulations and immunotherapy.

ISSAC questionnaire for allergic rhinitis has been developed to estimate its prevalence. It consists of six questions regarding the symptoms, severity and diagnosis of allergic rhinitis

# **AIMS AND OBJECTIVES**



## **AIMS AND OBJECTIVES**

1. To Estimate Prevalence of Asthma and Allergic Rhinitis among Vellore school Children aged 12 to 14 years, using an asthma questionnaire.
2. To study the correlation of socio demographic factors with prevalence of asthma in children.

# **MATERIALS AND METHODS**

## **MATERIALS AND METHODS**

### **STUDY DESIGN**

This cross sectional observational study to estimate the prevalence of asthma among the school children was done in Vellore district.

### **SAMPLE SIZE**

The sample size of 1125 was calculated assuming prevalence rate of 10% with precision of 20% and non response rate of 25%. The sample size was calculated using formula  $n=4pq/d^2$  (where n=no. of subjects, p=prevalence, q=1-p and d=precision)

### **INCLUSION CRITERIA**

All children in class 8th & 9th (to recruit children of age group 12-14 years) of the schools studied.

### **EXCLUSION CRITERIA**

1. Those children unable to get consent from family.
2. Children who are not able to read and respond to the questions in ISAAC questionnaire.

Vellore is one of the oldest cities in South India and lies on the bank of the Palar River. This city is located between Chennai (145 kms) and Bangalore (215 kms). Vellore has a tropical wet and dry climate and it has an elevation of 224 meters above sea level.

Schools within 5 km radius of Christian Medical college hospital were chosen. Principals of schools within this geographical limit were contacted for expression of interest. Among the schools who agreed to participate we randomly chose 2 private schools and 2 government schools so as to include children from different socioeconomic backgrounds.

The schools which were selected for the study had 1344 children in the age group 12 – 14yrs studying in 8th and 9th grade, hence all the children were invited to participate. This study was conducted from July 2012 to October 2012.

District Education officer was contacted and permission was obtained to conduct the survey in Government schools. The Principals of private schools obtained permission from the management of respective schools. Principal investigator met the Principals of the schools and briefed them about the study and gave written information sheet about the conduct of the study. It was decided to include children studying in eighth and ninth grades so as to recruit children in the age group 12-14. All eligible students were distributed consent form, proforma for demographic data and information sheets (see annexure 3&5). These documents were available in English and Tamil. Semi structured proforma consisted of socio demographic details like age, gender, number of family members, family history of asthma or allergies, socioeconomic status, parental education and type of fuel used for cooking. These forms were filled by the parents or by children with their parent's help. The completed forms were collected back by the respective class teachers and returned to the researcher. Those children, whose parents signed the consent forms, were recruited for the study after obtaining verbal assent from the child.

## **SURVEY**

On the day of the survey recruited children were assembled in the school assembly hall in the presence of their teacher. Survey was done in groups of 80-100 at a time. It started with a brief talk informing them the objective and importance of the study. This was followed by a talk and slide show on "asthma" explaining the symptoms and need for treatment. ISSAC questionnaire was distributed and students were asked to answer each question. Core questionnaire on asthma and allergic rhinitis was answered by the students. Each question was read out by the researchers, to ensure that the questions and the instructions were understood. Video questionnaire of ISAAC (AV 3.0) was administered and students watched each of the scenes showing characteristic symptoms of asthma before answering the corresponding questions.

## **ISAAC QUESTIONNAIRE**

This was chosen as this is the most widely used asthma questionnaire internationally. ISAAC questionnaire is developed and used by International Study of Allergy and Childhood Asthma group. It is widely accepted and validated questionnaire for diagnosis of childhood asthma. It is available as written as well as video questionnaire.

Original questionnaire in English was used for English speaking students and Tamil version was used for others. English version of the core questionnaire on asthma and allergic rhinitis was freely downloadable from the website and special permission was not required for its use.

Tamil version was prepared by the investigators following instructions for translation of questionnaire(28). English questionnaire was translated to Tamil by a native Tamil speaker who was proficient in English language. This was then back translated to English and compared with the original questionnaire. Based on the feedback, minor changes were made in the Tamil questionnaire.

## **VIDEO QUESTIONNAIRE**

Video questionnaire was obtained from the ISAAC team, Auckland and was used with their permission. It consisted of 5 video sequences depicting symptoms of asthma namely wheeze, exercise induced wheeze, nocturnal cough, nocturnal wheeze and acute severe wheeze. (See Annexure 7).

The written ISSAC core questionnaire for asthma was used without any modifications in the questions. But in ISSAC questionnaire for allergic rhinitis, the word "hayfever" was substituted with "dust allergy". This was done as dust allergy is a more culturally familiar term which refers to allergic rhinitis than "hay fever".



## **STATISTICAL ANALYSIS**

The informations obtained was transferred to excel spreadsheet and entered in SPSS version. Data was checked and cleaned.

The frequency analysis was done to assess the prevalence of asthma and various factors affecting it. Chi-square test was done. P value of  $<0.05$  was considered significant.

Kappa statistics was done to look for agreement between two questionnaires in identifying children with symptoms of asthma. The values of Kappa interpreted as 0.0=poor, 0.2=slight, 0.4=fair, 0.6=moderate, 0.8=substantial and 1=almost perfect.

# RESULTS

## RESULTS

This observational study to estimate asthma prevalence among school children was conducted in 4 schools in Vellore. There were 1344 children in classes 8 & 9 of these schools, who were invited to participate. 1159 of them obtained consent from parents (86%). 1093 children completed the questionnaire survey. Sixty six children were absent and could not be recruited inspite of multiple visits to the school.

Results of the study are presented in 4 sections

1. Demographic data of the subjects
2. Analysis of (a) core questionnaire on asthma, (b) video questionnaire and (c) allergic rhinitis questionnaire
3. Correlation with risk factors for asthma
4. Agreement between written and video questionnaires in estimating asthma symptom prevalence

## 1. DEMOGRAPHIC DATA

**Table1: Age Distribution of the children, n=1093**

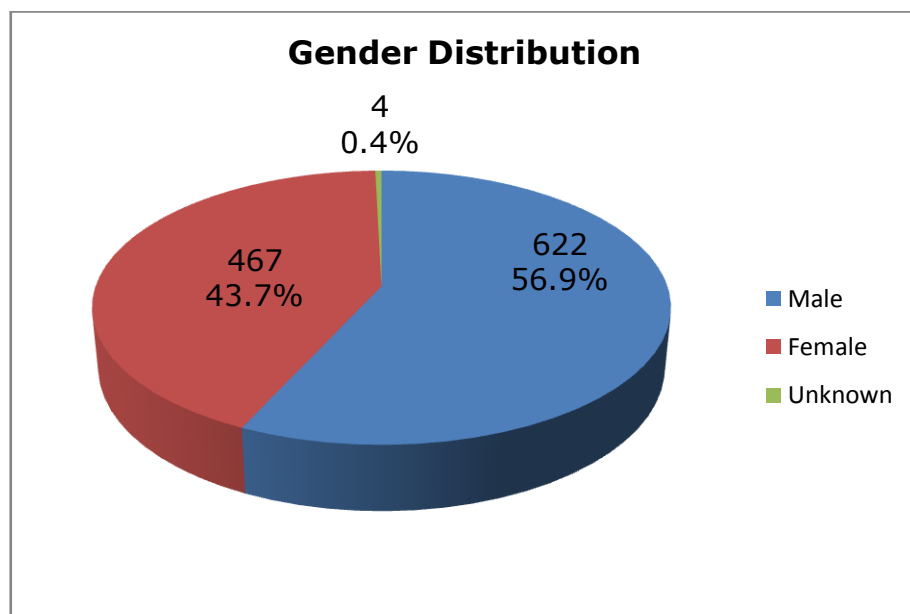
<b>Age</b>	<b>No: of children (%)</b>
12	110(10.1%)
13	478(43.7%)
14	426(39%)
15	43(3.95)
16	2(0.2%)
Age not mentioned	34(3.1%)
Total	1093(100%)

This observational study to study the prevalence of asthma in children 12-14 years of age was done on students of classes 8 & 9. Only 7% of the students were outside this age group. Majority of children were in 13-14 years age group (82.7%). This is the age group to which, ISAAC questionnaire was administered in the international studies.

**Table 2: Gender Distribution, n=1093**

Sex	Number (%)
Boys	622(56.9%)
Girls	467(42.73%)
Sex not mentioned	4(0.4%)
Total	1093

**Fig1: Gender distribution, n=1093**

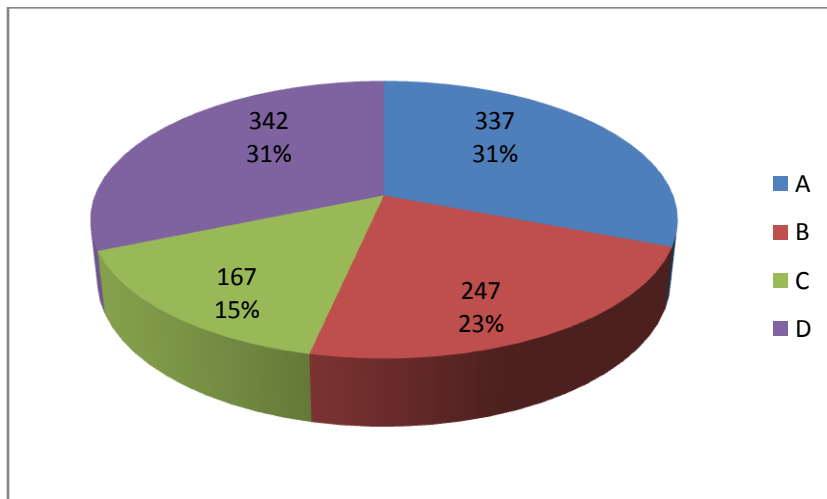


There was male predominance. The sex ratio was 1.3 :1

**Table 3: Distribution of subjects in each school**

<b>Name of the School</b>	<b>No of Participants</b>	<b>no. of boys</b>	<b>no. of girls</b>	<b>sex not mentioned</b>
A (private school)	337	188	149	
B (private school)	247	123	120	4
C (Govt school)	167	136	31	
D (Govt school)	342	175	167	
Total	1093	622	467	

**Fig 2: Distribution of subjects school wise.**



54% of school children were from private schools and 46% from Government schools.

## 2 (a) ANALYSIS OF DATA FROM CORE QUESTIONNAIRE ON ASTHMA

**Table 4: Children who “Ever Wheezed”, n=1093**

<b>Ever Wheezed</b>	<b>No. of Boys(%)</b>	<b>No. of Girls(%)</b>	<b>Total</b>	<b>Sex not mentioned</b>	<b>Total students</b>
Yes	81 (13%)	51(11%)	132	3	135(12%)
No	541(87%)	416(89%)	957	1	958(88%)
Total	622(100%)	467(100%)	1089	4	1093

p = 0.29

13% of all boys in the school reported that they ever wheezed while 11% of girls ever wheezed. This difference was not statistically different (p=0.29).

**Table 5: Children who had "Wheeze in past 12 months"**

Gender	No. Of Subjects	Wheeze In 12 Months	
		yes	%
Boys	622	37	5.9
Girls	467	25	5.3
Sex not mentioned	4	2	
Total No.	1093	64	5.9

chi square = 0.18,  $p = 0.66$

An affirmative response to the question "Did you wheeze in the past 12 months" has been shown to correlate most with the diagnosis of asthma. The prevalence of asthma in the community is the percentage of population who reports this symptom. According to this survey prevalence of asthma among school children in Vellore is 5.9%. There is no statistically significant difference between boys and girls in prevalence ( $p=0.66$ ).

Only children who are current wheezers were asked to respond to questions on frequency of asthma attacks and sleep disturbance with asthma in the past year.



**Table 6: Frequency of “Attacks of asthma” and “Sleep Disturbance”  
in children with asthma in the past year. n=64**

<b>Frequency Of Attacks In last year</b>	<b>no. of subjects</b>	<b>%</b>
< 4	40	62.5%
>/= 4	19	29.7%
Did not respond to question	5	7.8%
<b>Sleep Disturbance</b>	<b>no. of subjects</b>	<b>%</b>
Yes	40	62.5%
No	17	26.6%
Did not respond to question	7	10.9%

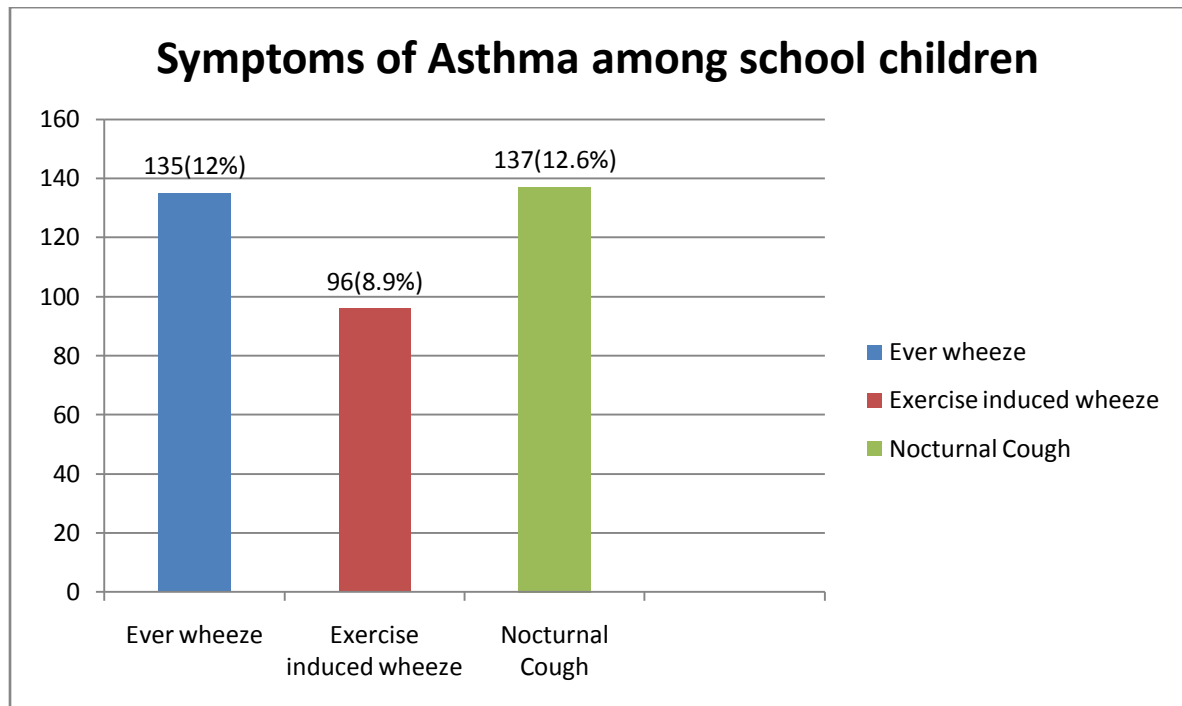
62.5% of current asthmatics reported that they had <4 attacks of asthma in the past year which corresponds to mild intermittent type.

While 26.6% of the current asthmatics did not report any nocturnal symptoms in the past year, 14% of current asthmatics reported night symptoms >1 night per week. This corresponds to a diagnosis of moderate persistent asthma.

**Table 7: Nocturnal Cough and Exercise Induced Wheeze, N=1093**

<b>Nocturnal Cough</b>	<b>No. of subjects (%)</b>
Yes	137(12.6%)
No	950(87.4%)
<b>Exercise Induced Wheeze</b>	
Yes	96(8.9%)
No	986(91.1%)

12.6% of all children reported that they had nocturnal cough apart from when they had cold. 8.9% of all children reported wheezing precipitated by physical activities.



**Fig 3: Bar Chart Showing number of children with Symptoms of Asthma n=1093**

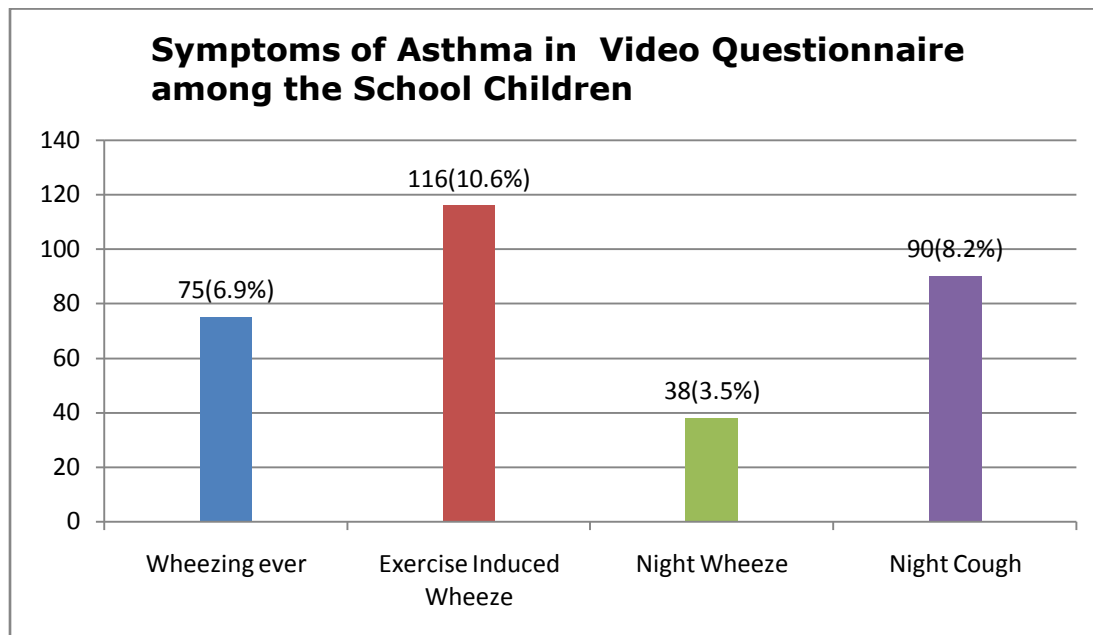
## 2 (b) ANALYSIS OF DATA ON VIDEO QUESTIONNAIRE

**Table 8: Number of children who recognized symptoms of asthma in the video questionnaire, n=1092**

Video Sequence	No. of subjects (%)
Wheezing ever	75(6.9%)
Wheeze 12 months	36 (3.3%)
Exercise Induced Wheeze	116(10.6%)
Night Wheeze	38(3.5%)
Night Cough	90(8.2%)
Severe Wheeze	36 (3.3%)

Approximately 7% of the children studied, reported that they had experienced a wheeze episode in their life after watching the “wheeze” scenario on video. Among them, 48% had this episode atleast once in the past year. That constitutes 3.3% of the total subjects studied. Hence prevalence of current wheezing in the population studied, is 3.3% by video questionnaire.

**Fig 4: Bar Chart Showing Symptoms of Asthma in Video Questionnaire among the School Children**



Prevalence of exercise induced wheeze, nocturnal wheeze and nocturnal cough were estimated to be 10.6%, 3.5% and 8.2% respectively when video questionnaire was used.

After watching the scene depicting acute severe asthma, 3.3 % of them reported that they had had atleast one episode of acute severe asthma.

**Table 9: Prevalence of Asthma among School**

**Children as assessed by different methods n=1093**

<b>Method</b>	<b>Prevalence</b>
Scoring system	4.3%
Written questionnaire	5.9%
Video questionnaire	3.3%
Asthma diagnosis already made	3.8%

The prevalence of asthma by scoring system, written questionnaire and video question were 4.3%, 5.9% and 3.3% respectively.

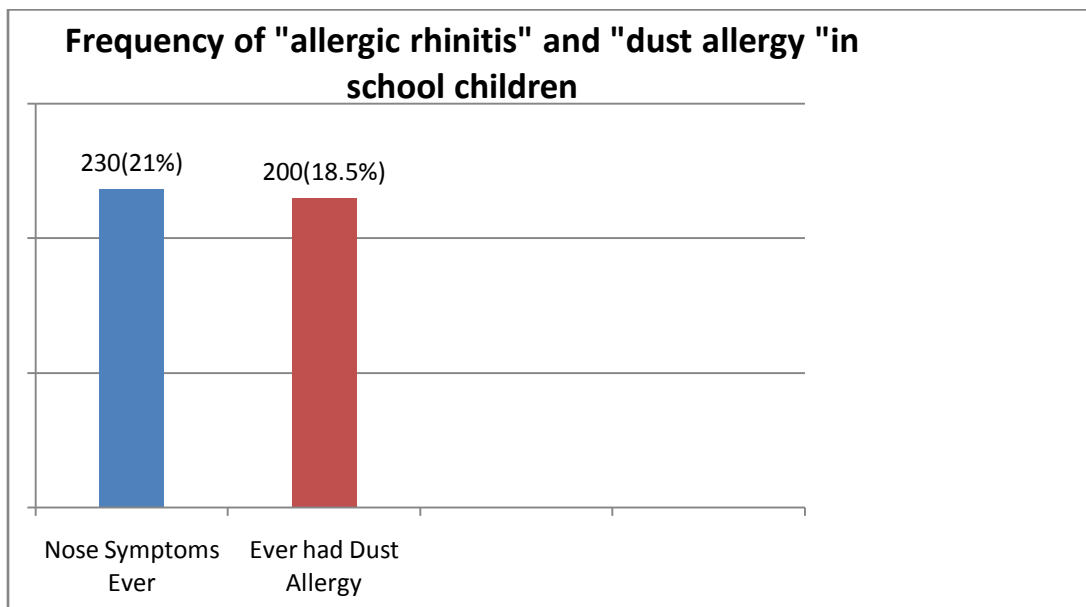
The score of 6 or more for symptoms of asthma is considered as diagnosis of asthma (see Annexure 8). In this study, the prevalence of asthma was 4.3% by scoring system.

## 2 (c) ANALYSIS OF ALLERGIC RHINITIS QUESTIONNAIRE

**Table 10: Prevalence of symptoms of Allergic Rhinitis among surveyed school Children, n=1093**

Symptoms Enquired	Number (%)
Nose Symptoms Ever	230(21%)
Nose Symptoms in past 12 months	177 (16%)
Ever had "Dust Allergy"	200(18.5%)

**Fig5: Bar chart showing Frequency of allergic rhinitis in School Children**



21% of all children reported that they had nasal symptoms consistent with Allergic Rhinitis ever in their life. 19% reported that they have “dust allergy”- a common term used in Tamil Nadu to usually mean allergic rhinitis.

Prevalence of current allergic rhinitis in this study is 16%. Among those with current allergic rhinitis, 36.5% reported symptoms of allergic conjunctivitis 4.8% reported that the symptoms interfered with their daily activities moderately.



**Table 11: Age and Gender Distribution of School Children with Allergic Rhinitis, n=1093**

<b>Age</b>	<b>Total no. of children</b>	<b>Children with nasal symptoms no (%)</b>	<b>Girls no (%)</b>	<b>Boys no (%)</b>	<b>Sex not mentioned</b>
12	110	22(9.6%)	4(5.6%)	18(11.5%)	
13	478	88(38.3%)	30(41.7%)	58(37.2%)	
14	426	97(42.2%)	31(43.1%)	66(42.3%)	
15	43	10(4.3%)	2(2.8%)	8(5.1%)	
16	2	1(0.4%)	0(0%)	1(0.6%)	
Age not mentioned	34	12(5.2%)	5(2.2%)	5(3.2%)	2
Total	1093	230(100%)	72(100%)	156(100%)	2

**Table 12: Prevalence of Allergic Rhinitis symptoms (ever) among girls and boys, n=1093**

<b>Gender</b>	<b>Ever had nose symptoms</b>	<b>Never had nose symptoms</b>	<b>Total</b>
Boys	156 (25%)	466 (75%)	622 (100%)
Girls	72 (15.4%)	395 (84.6%)	467 (100%)
Sex not mentioned	2	2	4
Total	230	863	1093 (100%)

p value = <0.05

Prevalence of allergic rhinitis symptoms (ever) was higher among boys than among girls (25% vs 15%). This difference was statistically significant  $p < 0.05$

**Table 13: Prevalence of “current” Allergic Rhinitis (AR) among boys and girls, n=230,**

<b>Gender</b>	<b>No. Of Subjects</b>	<b>Allergic rhinitis present yes %</b>	
Boys	156	114	73.1%
Girls	72	62	86.1%
Sex not mentioned	2	2	
Total	230	177	

p value = 0.05

Among the boys who ever had allergic rhinitis symptoms, 73% were currently symptomatic. 86 % of the girls with allergic rhinitis had symptoms in past 12 months.

10.4% and 16.1% of school children with allergic rhinitis (ever)

had family history of asthma and allergy respectively.

### 3. CORRELATION WITH RISK FACTORS FOR ASTHMA

**Table 14: Children who “Ever wheezed” and family history of asthma**

Ever wheezed	Family history of wheeze		Did not respond	Total
	yes	no		
Yes	11(8%)	114(84%)	10(7%)	135 (100%)
No	45 (4%)	857 (89%)	56 (6%)	958 (100%)
Total	56	971	66	1093

Among children who wheezed 8% had family history of asthma as compared to 4% of children who never wheezed in their life. This difference is not statistically significant ( $p=0.08$ ). A number of children did not provide information on family history of asthma probably due to stigma attached to this diagnosis.

**Table 15: Current Asthma and family history of asthma**

<b>Current wheezer</b>	<b>Family history of asthma</b>		<b>Did not respond</b>	<b>Total</b>
	<b>Yes</b>	<b>No</b>		
Yes	5(8%)	53(82%)	6(10%)	64(100%)
No	51(5%)	918(89%)	60(6%)	1029(100%)
Total	56	971	66	1093

p value >0.05

There was no statistically significant difference in family history of asthma between current asthmatics and those who were not.

**Table 16: Children who ever wheezed and second hand cigarette smoke exposure**

<b>Ever wheezed</b>	<b>Cig. smoke exposure</b>			<b>Total</b>
	<b>Yes</b>	<b>No</b>	<b>Did not respond</b>	
Yes	9(6.7%)	115(85.2%)	11(8.1%)	135(100%)
No	111(11.6%)	788(82.3%)	59(6.1%)	958(100%)
Total	120(11%)	903(82.6%)	70(6.4%)	1093(100%)

chi square = 3.69, p value = 0.29

**Table 17: Current asthmatics and second hand cigarette smoke exposure**

<b>Wheeze in past 12 months</b>	<b>Cig. smoke exposure</b>			<b>Total</b>
	<b>Yes</b>	<b>No</b>	<b>No response</b>	
Yes	4(6.2%)	53(82.8%)	7(11%)	64(100%)
No	116(11.2%)	850(82.6%)	63(6.1%)	1029(100%)
Total	120(10.9%)	903(82.6%)	72(6.5%)	1093(100%)

10.9% of all children reported that they were exposed to smoking. There was no statistically significant difference between children who ever wheezed or never wheezed in terms of smoke exposure (p value = 0.29). This was the case with current asthmatics and those who were not (p value>0.05)

**Table18: Co existence of asthma and allergic rhinitis in children**

	<b>Current Allergic Rhinitis</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
Current asthma	30 (47%)	34 (53%)	64 (100%)
Ever wheezed	57 (42%)	78 (58%)	135 (100%)

47% of children with asthma and 42% children who ever wheezed had allergic rhinitis in the past year.



#### 4. COMPARISON OF VARIOUS METHODS USED FOR ESTIMATION OF PREVALENCE OF ASTHMA SYMPTOMS

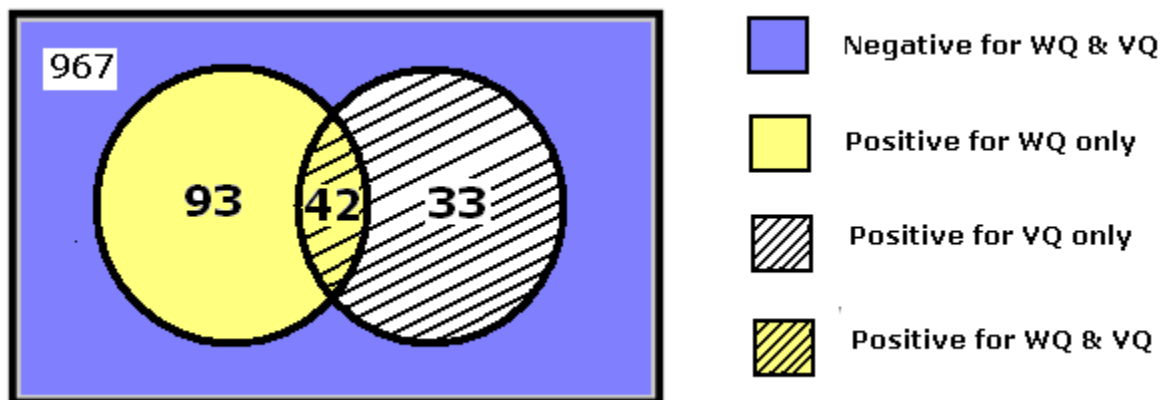
**Table 19: Assessment of frequency of symptoms by different methods [Correlation between written questionnaire (WQ) and video questionnaire (VQ)]**

Symptom	No of children who reported symptom in written questionnaire	No of children who reported symptom in video questionnaire	No of children who reported in both questionnaires
Ever wheezed	135	75	42
Exercise induced wheeze	96	116	44
Nocturnal cough	137	90	40

There is only **slight to fair agreement** between the 2 questionnaires in identifying children who “ever wheezed”, “had exercise induced wheeze” and “had nocturnal cough” (kappa 0.29-0.35).

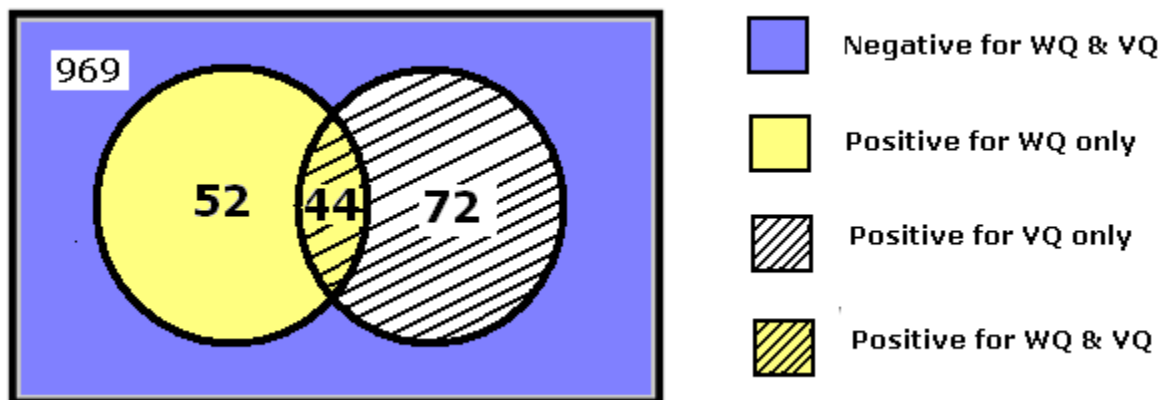
It is represented schematically below:

**Fig6: Venn diagram showing frequency of positive response or negative response to either one or both questionnaires (WQ and VQ) for the question "Have you ever had wheeze"**



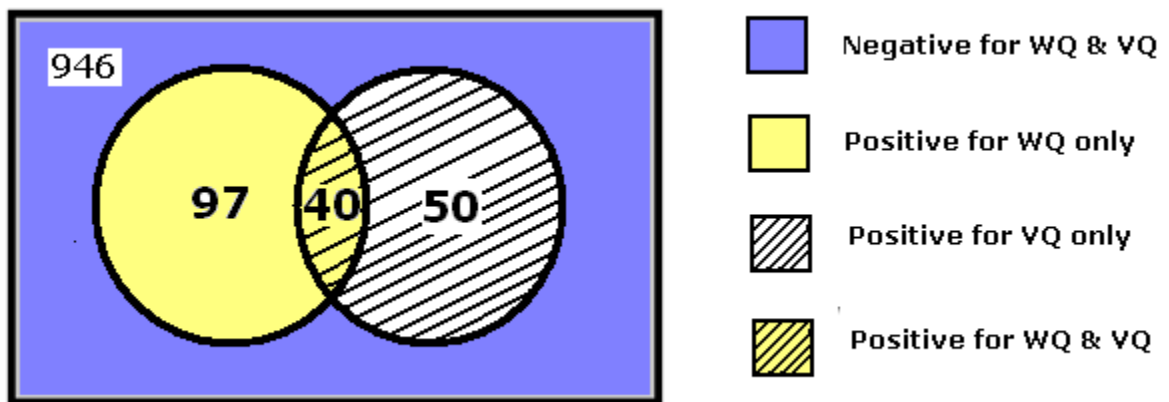
**Kappa = 0.342 (Agreement slight to fair)**

**Fig7: Venn diagram showing frequency of positive response or negative response to either one or both questionnaires for the question "Do you have wheeze with exercise"**



**Kappa = 0 .355 (Agreement slight to fair)**

**Fig8: Venn diagram showing frequency of positive response or negative response to either one or both questionnaires for the question "Have you had night cough"**



**Kappa = 0.290 (Agreement slight to fair)**

# **DISCUSSION**

## **DISCUSSION**

In this study the prevalence of asthma among school children aged 12 -14 residing in Vellore was 5.9%.

Only few studies have been done in South India. Bangalore, Chennai and Puducherry are the cities close to Vellore. The prevalence of asthma was 29.5% in 1999 in Bangalore(7), whereas in Chennai, the prevalence of diagnosed asthma was 5% in a study by Chakravathy(8). Both the studies used ISSAC questionnaire translated in local language Kannada and Tamil respectively. According to a recently published article by Ganesh Kumar, the overall prevalence of asthma among school children in rural Puducherry was 8.7%(42). In this study each subject was interviewed by the researcher himself, hence the response rate was high (97.5%).

In North India the prevalence of asthma ranges from 1% to 11.6%. A study done by Sharma et al in Jaipur(41), showed that 8.4% of children wheezed in past 12 months but 5.3% reported that they were diagnosed to have asthma by physician.

In most studies, it was observed that a lower percentage of children reported that they were already diagnosed to have asthma compared to the prevalence of estimated by the respective study (8)(31). This was true in our study also where only 3.8% reported already diagnosed asthma against a prevalence rate of 6%.

## **GENDER**

Majority of the studies revealed male predominance in asthma prevalence across the world. Anatomically, it has been shown that boys have smaller airway in comparison to their lung volume when compared to girls(12). In this study there was no statistically significant difference in prevalence of asthma in two sexes.

The sex hormones have some influence on hyperresponsiveness of airways. It has been shown that estrogen is pro inflammatory in females and testosterone is anti inflammatory in males, hence reversal of prevalence of asthma and allergic diseases can occur in prepubertal age (13)(52). But we did not observe a higher prevalence in the adolescent girls we studied.

A study conducted in Baghdad(53) among children 6-12 years, asthma prevalence was higher in older girls as compared to boys, whereas prevalence of life time wheeze was more in boys.

## **CORRELATION WITH RISK FACTORS FOR ASTHMA**

Family history of asthma is a well known risk factors for asthma(54). In this study, 8% of children with wheeze ever had family history of asthma compared to who never wheezed in their life, where family history was positive in only 4%. This was found to be insignificant statistically. As there were good number of non respondents, reliability of this inference is doubtful.



## **ASSOCIATION OF ASTHMA WITH EXPOSURE TO SMOKING**

We could not find any correlation between prevalence of asthma and exposure to smoking in our study. There are many studies which shows good correlation(5)(14). Many of the children/parents might not have reported about smoking as there were many non respondents to this question also. .

## **COMPARISION OF WRITTEN QUESTIONNAIRE AND VIDEO QUESTIONNAIRE**

In our study prevalence of symptoms varied when assessed by the two questionnaire namely written questionnaire (WQ) and video questionnaire(VQ). The written questionnaire showed higher prevalence for symptoms of wheeze ever (12.4% vs 6.9%) and nocturnal cough (12.6% vs 8.2%) whereas video questionnaire gave higher prevalence for exercise induced wheeze (8.9% vs 10.6%).

A similar study done on Thai school children (55) showed comparable findings except that exercise induced wheeze had lower percentage of reporting by video questionnaire. Another study in Mozabican school children also showed prevalence of current asthma by video questionnaire (11.9%) to be lower as compared to 13.3% in written questionnaire(56).

A study by J Crane(57) showed that responses in the video questionnaire showed a lower prevalence than written questionnaire and the responses were closely correlated (kappa 0.89) in the sense with good negative agreement but poor positive agreement.

The lower reporting of some symptoms in video questionnaire could be because the adolescents do not identify with the dramatic scenes depicting symptoms in the video. Children who have had milder forms of the symptom may not report that they had symptoms as severe as that depicted in the video.

The total asthma score of 6 or more for symptoms of asthma has been shown to correlate with diagnosis of asthma ie wheeze in past 12 months(31)(see annexure 8).In this study, the prevalence of asthma was 4.3% by scoring system as against 5.9% for wheeze in past 12 months

We looked for agreement between the questionnaires in identifying children with symptoms for ever wheeze, exercise induced wheeze and nocturnal cough and the agreement was slight to fair(kappa 0.34,0.36 and 0.29 respectively).Lai et al showed in their study, the correlation with wheeze and exercise induced wheeze in two questionnaire was fair and the Kapper indices were 0.44 and 0.43 respectively(32).

## **ALLERGIC RHINITIS**

Increasing trend is also observed in allergic rhinitis prevalence. There are not many studies done in India. In our study the prevalence of allergic rhinitis is 21% and 36% of them had nose symptoms in past one year. Only 13.8% reported that nose symptoms affected their daily activities. An ISAAC study by Beasley (58) showed that 18.6% of children in India had nasal symptoms alone.

# **LIMITATIONS**

## **LIMITATIONS**

This study has certain limitations.

1. Most important limitations of this prevalence study are those that are inherent to the use of questionnaires. Some children may not have understood the question clearly, yet answered it. There were few incomplete forms where information on sex, age and other details were not provided.
2. There were many non respondents to the questions on family history and cigarette smoke exposure, possibly fearing stigmatisation. This could have affected the results.
3. Some children could not be recruited to the study inspite of multiple visits to each school as they were absent.
4. As stated in the objective, this is only a questionnaire based survey and no attempt was made to verify the diagnosis by review of individual history, physical examination or investigations.

# **CONCLUSION**

## **CONCLUSION**

1. The prevalence of asthma is 5.9% in school children of Vellore South India in the age group 12 -14 years.
2. No statistically significant difference in prevalence of asthma was found between boys and girls in this study.
3. 8% of children with asthma had family history of asthma and 6.2% of asthmatics were exposed to cigarette smoke in their homes. There was no statistically significant difference between asthmatics and non asthmatics in terms of family history or Cigarette smoke exposure.



4. The agreement between the written questionnaire and the video questionnaire was slight to fair in identifying children with asthma symptoms (kappa 0.29-0.35).
5. The prevalence of allergic rhinitis was 21 %. Among those who had allergic rhinitis 36.5 % reported that they had symptoms of allergic conjunctivitis and 4.8% reported that nasal symptoms moderately affected their activities.
6. There was a higher prevalence of allergic rhinitis ever in boys as compared to girls ( 84.4 % vs 79.5 %,  $p < 0.05$  )

# **RECOMMENDATION**

## **RECOMMENDATIONS**

1. Studies on prevalence of asthma are important and repetition of the study should be done 3-5 years to assess the trends in prevalence.
2. Video questionnaire alone may not be useful to assess the prevalence, hence it should be used as an additional tool to support the written questionnaire.
3. With a prevalence of 6% among 12-14 year olds in Vellore schools, 2-3 asthmatics are likely to be there in each class. There is a need to educate teachers about recognition of asthma symptoms and administration of inhalers as an emergency.

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# **ANNEXURE**

## ANNEXURE 1. IRB APPROVAL LETTER



**INSTITUTIONAL REVIEW BOARD (IRB)**  
**CHRISTIAN MEDICAL COLLEGE**  
VELLORE 632 002, INDIA

**Dr.B.J.Prashantham, M.A.,M.A.,Dr.Min(Clinical)**  
Director, Christian Counseling Centre  
Editor, Indian Journal of Psychological Counseling  
Chairperson, Ethics Committee, IRB

**Dr. Alfred Job Daniel, MS Ortho**  
Chairperson, Research Committee &  
Principal

**Dr.Gagandeep Kang, MD, Ph.D, FRCPath**  
Secretary, Research Committee, IRB  
Additional Vice Principal(Research)

October 12, 2011

Dr. S. Gunawathi  
Department of Paediatrics  
Christian Medical College  
Vellore 632 002

Sub: **FLUID Research grant project NEW PROPOSAL:**  
Prevalence of Asthma and Allergic Rhinitis in School Children aged 10 to 15  
years residing in Vellore  
Dr. S. Gunawathi, First Year, Paediatrics, Dr. Sneha Varkki, Paediatrics.

Ref: IRB Min. No. 7625 dated 3.10.2011

Dear Dr. Gunawathi,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project entitled "Prevalence of Asthma and Allergic Rhinitis in School Children aged 10 to 15 years residing in Vellore" on October 3, 2011.

The Committees reviewed the following documents:

1. Format for application to IRB submission
2. Information Sheet and Consent Form (English and Tamil)
3. Proforma(English and Tamil)
4. Cv of Dr. S. Gunawathi
5. A CD containing document 1 - 4

The following Institutional Review Board (Ethics Committee) members were present at the meeting held on October 3, 2011 in the CREST/SACN Conference Room, Christian Medical College, Bagayam, Vellore- 632002.

Name	Qualification	Designation	Other Affiliations
Dr. B.J.Prashantham	MA (Counseling), MA (Theology), Dr Min(Clinical)	Chairperson(IRB)& Director, Christian	Non-CMC



**INSTITUTIONAL REVIEW BOARD (IRB)**  
**CHRISTIAN MEDICAL COLLEGE**  
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Principal

**Dr.Gagandeep Kang, MD, Ph.D, FRCPath**  
Secretary, Research Committee, IRB  
Additional Vice Principal(Research)

Mr. Harikrishnan	BL	Counselling Centre	
Mrs. Mary Johnson (on behalf of Dr. Jayarani Premkumar)	M.Sc. (Nursing), Ph.D.	Lawyer	Non-CMC
Dr. Vathsala Sadan (on behalf of Mrs. Rosaline Jayakaran)	M.Sc. (Nursing), RN, RM	Nursing Superintendent, CMC.	
Dr. Gagandeep Kang	MD, PhD, FRCPath.	Dean, College of Nursing, CMC.	
		Secretary IRB (EC)& Dy. Chairperson (IRB). Professor of Microbiology & Addl. Vice Principal (Resc CMC.	

We approve the project to be conducted as presented.

The Institutional Ethics Committee / Independent Ethics Committee expects to be informed about the progress of the project, any SAE occurring in the course of the project, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

A sum of ₹ 23,000/- (Rupees twenty three thousand only) is sanctioned for 1 year.

Yours sincerely,

Dr. Alfred Job Daniel  
Principal & Chairperson (Research Committee)  
Institutional Review Board

## **ANNEXURE 2. LETTER TO THE PRINCIPAL**

Dear Principal and Teachers

Study:Prevalence of asthma and allergic rhinitis in children

We are inviting some children at your school to take part in an important study about child health with the approval of their parents. We wish to study children aged 13 and 14 years.

This survey is being carried out in randomly selected schools in Vellore. The purpose of the study is to understand more about the increasing problem of respiratory symptoms in children of this age group.

For your school, it would mean:

1. Identifying classes in which 12-14 year olds are found and making available a copy of the class lists with date of birth if possible.
2. During this term one of our research team would bring information sheets for parents (copy enclosed) to the school, to be distributed to all the selected children one week before the study team come to your school.
3. We would return the next week to ask these children to complete written questionnaires (copy enclosed) and to watch a video about exercise and breathing which lasts about ten minutes. We would require about 40 minutes in total.
4. We would come back about a week later, with the questionnaires and show the video to any children who were absent on the first occasion and ask them to complete the survey.

One of our research team will be in contact with you soon to discuss this survey further. In the meantime if there is any further information you require about the survey, please do not hesitate to contact one of us. If you are unable to reach us directly by telephone, please leave a message with our secretary Mrs Padmini.

This study has been approved by our Ethics Committee.

Tentative date:

## **ANNEXURE 3 : INFORMATION SHEET, CONSENT FORM & PROFORMA**

### **INFORMATION SHEET FOR PARENTS STUDY ON ASTHMA AND ALLERGIC RHINITIS IN SCHOOL CHILDREN AGED 12 -14 YEARS RESIDING IN VELLORE**

Asthma is a disease condition where there is narrowing of airway resulting in difficulty in breathing. There may be noisy sound in chest, tightness in chest or cough. Person suffering from this disease will experience the symptoms every now and then which can be severe needing hospitalisation. Those with family history of asthma or allergy have higher chance of asthma.

In recent years there has been a rise in the number of children affected with asthma. It is a condition which can be controlled by medications and regular follow up with doctor.

Childhood asthma is underestimated in our country. There aren't many studies done in Tamilnadu and none in Vellore to see how many children are affected. Hence we are planning this study. Your child will be given a simple questionnaire asking if he/she ever had symptoms of wheeze, night cough or wheeze with exercise. He/ she will be shown a video of persons having the above symptoms.

#### **How does my child's participation help in the study?**

By participating in this study you will actually help us in various ways. One with information you provide, we will be able to estimate the magnitude of asthma in school children in Vellore.

Secondly if we suspect your child has asthma, we will inform you and you can get your child evaluated and treated.

If you are willing for your child to take part in the survey, please sign 2 copies of consent form and fill up the proforma sheet. You may keep the information sheet and a copy of consent form. Please send the proforma and the second copy of consent to the school with your child.

Any clarification contact :Dr. S. Gunawathi/Dr.Sneha Varkki  
Department of Paediatrics unit 3  
CMC, Vellore. Phone 0416 2283343

Tentative date for the school survey-----

CONSENT FORM  
(1<sup>st</sup> copy for the family)

Title: To estimate prevalence of asthma and allergic rhinitis in school children aged 12-14 yrs

Name of the child:

Class:

Study no:.....(for office use)

1. I confirm that I have read and understood the information sheet dated .....for above study and have had opportunity to ask questions.
2. I understand that my child's participation is voluntary.
3. I agree to have my child take part in the study

Date & signature

Name of the parent      -----

Researcher      -----

**This sheet to be sent to school with your child**

PROFORMA

STUDY ON ASTHMA AND ALLERGIC RHINITIS IN SCHOOL CHILDREN AGED 12 TO 14 YRS

Study No:.....(for office use)

Name :.....

Date of birth.....Age.....Gender.....

Address.....  
.....  
.....

Contact no: Phone no.....  
Mobile no.....

No. of family members **1 /2 /3 /4 /5**

Family history of asthma **Yes / No**

Is there history of asthma in	Father	<b>Yes / No</b>
	Mother	<b>Yes / No</b>
	Sisters/brothers	<b>Yes / No</b>

History of allergy in parents, sister or brother **Yes / No**

If yes, who has/have .....

Exposure to smoking **Yes / No**

Fuel used for cooking 1.woodfire  
2. Kerosene  
3 .Liquefied Petroleum Gas(cooking gas)

Parental education

Father.....occupation.....

Mother.....occupation.....

Monthly income approximately .....

Form filled by:.....

Date and signature:.....



## ANNEXURE 4. ISAAC WRITTEN & VIDEO QUESTIONNAIRE

### 7.2 Module 1.1 Core questionnaire for wheezing and asthma

Questionnaire for 13 and 14 year olds

- |   |  |     |                          |
|---|--|-----|--------------------------|
| 1 | Have you <u>ever</u> had wheezing<br>or whistling in the chest<br>at any time in the past? | Yes | <input type="checkbox"/> |
|   |  | No  | <input type="checkbox"/> |

IF YOU HAVE ANSWERED "NO" PLEASE SKIP TO QUESTION 6

- |   |   |     |                          |
|---|---|-----|--------------------------|
| 2 | Have you had wheezing or<br>whistling in the chest<br><u>in the last 12 months?</u> | Yes | <input type="checkbox"/> |
|   |   | No  | <input type="checkbox"/> |

IF YOU HAVE ANSWERED "NO" PLEASE SKIP TO QUESTION 6

- |   |   |              |                          |
|---|---|--------------|--------------------------|
| 3 | How many attacks of wheezing<br>have you had<br><u>in the last 12 months?</u> | None         | <input type="checkbox"/> |
|   |   | 1 to 3       | <input type="checkbox"/> |
|   |   | 4 to 12      | <input type="checkbox"/> |
|   |   | More than 12 | <input type="checkbox"/> |

- |   |   |                              |                          |
|---|---|------------------------------|--------------------------|
| 4 | <u>In the last 12 months</u> , how often, on average, has<br>your sleep been disturbed due to wheezing? |                              |                          |
|   |   | Never woken with wheezing    | <input type="checkbox"/> |
|   |   | Less than one night per week | <input type="checkbox"/> |
|   |   | One or more nights per week  | <input type="checkbox"/> |

- |   |   |     |                          |
|---|---|-----|--------------------------|
| 5 | <u>In the last 12 months</u> , has wheezing<br>ever been severe enough to limit your<br>speech to only one or two<br>words at a time between breaths? | Yes | <input type="checkbox"/> |
|   |   | No  | <input type="checkbox"/> |

- |   |                                  |     |                          |
|---|----------------------------------|-----|--------------------------|
| 6 | Have you <u>ever</u> had asthma? | Yes | <input type="checkbox"/> |
|   |                                  | No  | <input type="checkbox"/> |

- |   |  |     |                          |
|---|--|-----|--------------------------|
| 7 | <u>In the last 12 months</u> , has your<br>chest sounded wheezy<br>during or after exercise? | Yes | <input type="checkbox"/> |
|   |  | No  | <input type="checkbox"/> |

- |   |  |     |                          |
|---|--|-----|--------------------------|
| 8 | <u>In the last 12 months</u> , have you<br>had a dry cough at night,<br>apart from a cough associated with<br>a cold or chest infection? | Yes | <input type="checkbox"/> |
|   |  | No  | <input type="checkbox"/> |

## 7.3 Module 1.2: Core questionnaire for rhinitis

### 7.3.1 Questionnaires

Questionnaire for 13 and 14 year olds

All questions are about problems which occur when you DO NOT have a cold or the flu.

- 1 Have you ever had a problem with sneezing, or a runny, or blocked nose when you DID NOT have a cold or the flu? Yes ☐  
No ☐

IF YOU HAVE ANSWERED "NO" PLEASE SKIP TO QUESTION 6

- 2 In the past 12 months, have you had a problem with sneezing, or a runny, or blocked nose when you DID NOT have a cold or the flu? Yes ☐  
No ☐

IF YOU HAVE ANSWERED "NO" PLEASE SKIP TO QUESTION 6

- 3 In the past 12 months, has this nose problem been accompanied by itchy-watery eyes? Yes ☐  
No ☐

- 4 In which of the past 12 months did this nose problem occur? (Please tick any which apply)

January	<input type="checkbox"/>	May	<input type="checkbox"/>	September	<input type="checkbox"/>
February	<input type="checkbox"/>	June	<input type="checkbox"/>	October	<input type="checkbox"/>
March	<input type="checkbox"/>	July	<input type="checkbox"/>	November	<input type="checkbox"/>
April	<input type="checkbox"/>	August	<input type="checkbox"/>	December	<input type="checkbox"/>

- 5 In the past 12 months, how much did this nose problem interfere with your daily activities?:

Not at all	<input type="checkbox"/>
A little	<input type="checkbox"/>
A moderate amount	<input type="checkbox"/>
A lot	<input type="checkbox"/>

- 6 Have you ever had hayfever? Yes ☐  
No ☐

## 7.5 Module 1.4: Video questionnaire

### 7.5.1 Questionnaire

- |    |  |     |                          |    |                          |
|----|--|-----|--------------------------|----|--------------------------|
| 1. | Has your breathing ever been like this?:                                 |     |                          |    |                          |
|    | at any time in your life?  | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; in the last year?   | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; one or more times a month?                                      | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| 2. | Has your breathing been like the girl's in the video following exercise? |     |                          |    |                          |
|    | at any time in your life?  | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; in the last year?   | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; one or more times a month?                                      | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| 3. | Have you been woken like this at night?:                                 |     |                          |    |                          |
|    | at any time in your life?  | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; in the last year?   | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; one or more times a month?                                      | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| 4. | Have you been woken like this at night?:                                 |     |                          |    |                          |
|    | at any time in your life?  | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; in the last year?   | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; one or more times a month?                                      | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
| 5. | Has your breathing been like this?:                                      |     |                          |    |                          |
|    | at any time in your life?  | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; in the last year?   | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|    | if YES,; one or more times a month?                                      | YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
-

## ANNEXURE 5: INFORMATION SHEET, CONSENT FORM & PROFORMA IN TAMIL

### பெற்றோருக்கான தகவல் அறிக்கை

12-14 வயதிற்குட்பட்ட வேலூரில் வசிக்கும் பள்ளிக்குச் செல்லும் சிறுவர்களில் ஆஸ்துமா மற்றும் அலர்ஜி பற்றிய ஆய்வு

ஆஸ்துமா என்பது மூச்சுக்குழாய் அடைப்பினால் ஏற்படும் மூச்சு கஷ்டம் மற்றும் சுவாசித்தலின் போது நெஞ்சில் ஏற்படும் சத்தம், நெஞ்சடைப்பு அல்லது இருமல். மேற்கண்ட அறிகுறிகள் தொடர்ந்து அல்லது விட்டு விட்டு அதிகமாக இருப்பவர்கள் மருத்துவமனையில் இருந்து சிகிச்சை பெறவேண்டும். குடும்பத்தில் எவருக்கேனும் ஆஸ்துமா அல்லது அலர்ஜி இருந்தால் ஆஸ்துமா வருவதற்கான வாய்ப்புகள் அதிகம். தற்போது ஆஸ்துமா பாதிக்கப்பட்ட சிறுவர்களின் எண்ணிக்கை அதிகமாகி வருகிறது. இருப்பினும் மருத்துவர்களின் சிகிச்சையினாலும், தொடர் கவனிப்பினாலும் கட்டுப்படுத்தப்படுகிறது.

நமது நாட்டில் சிறுவர்களுக்கான ஆஸ்துமா குறைத்து மதிப்பிடப்படுவதாலும், தமிழகத்திலும் நிறைய ஆய்வுகள் நடைபெறாததாலும் நாங்கள் இந்த ஆய்வினை மேற்கொள்கிறோம். உங்கள் மகன் / மகளிடம் எளிமையான கேள்விகள் அடங்கிய படிவம் கொடுக்கப்படும் அதில் அவர்களுக்கு மூச்சுக் கஷ்டம், இரவு நேர இருமல் அல்லது உடற்பயிற்சியின் போது மூச்சு கஷ்டம் போன்ற அறிகுறிகள் உள்ளனவா என கேட்கப்பட்டிருக்கும். மேலும் அவர்களுக்கு அதைப் பற்றிய வீடியோ காட்டப்படும்.

என் மகன் / மகள் இந்த ஆய்வில் பங்கு பெற்று உதவுவது எப்படி?

இந்த ஆய்வில் கலந்து கொள்வதினால் தாங்கள் தரும் தகவலின் அடிப்படையில் வேலூரில் பள்ளிக்குச்

செல்லும் சிறுவர்களின் ஆஸ்துமா பற்றிய சரியான எண்ணிக்கை கிடைக்கும். மேலும் உங்கள் மகன் /

மகளுக்கு ஆஸ்துமா இருப்பது தெரியவந்தால் அதற்கான சிகிச்சை அளிக்கப்படும்.

மேலும் விபரங்களுக்கு தொடர்பு கொள்ள

Dr. Sethuraju Gunawathi / Dr. Sneha Varkki

Dept.of Paediatrics,

CMC Vellore. Phone: 0416 2283343

**ஒப்புதல் படிவம்**

**10-15 வயதிற்குட்பட்ட வேலூரில் வசிக்கும் பள்ளிக்குச் செல்லும் சிறுவர்களில்**

**ஆஸ்துமா மற்றும் அலர்ஜி பற்றிய ஆய்வு**

பெயர் : \_\_\_\_\_

வகுப்பு : \_\_\_\_\_

ஆய்வு எண் : \_\_\_\_\_

1. நான் மேற்கண்ட ஆய்வு பற்றிய அறிக்கை தேதி \_\_\_\_\_ நன்கு  
படித்தும், விசாரித்தும் தெளிவாக புரிந்துகொண்டேன்.

2. தன்னார்வத்தோடு இதில் கலந்து கொள்கிறேன்.

3. மேற்கண்ட ஆய்வில் என் மகன் / மகள் கலந்துகொள்ள முழு ஒப்புதல்  
அளிக்கிறேன்.

\_\_\_\_\_

பெற்றோர் பெயர்

\_\_\_\_\_

தேதி

\_\_\_\_\_

கையொப்பம்

\_\_\_\_\_

ஆய்வாளர் பெயர்

\_\_\_\_\_

தேதி

\_\_\_\_\_

கையொப்பம்

படிவம்

12-14 வயதிற்குட்பட்ட வேலூரில் வசிக்கும் பள்ளிக்குச் செல்லும் சிறுவர்களில் ஆஸ்துமா மற்றும் அலர்ஜி பற்றிய ஆய்வு

ஆய்வு எண் : \_\_\_\_\_

1. பெயர் : \_\_\_\_\_

2. பிறந்த தேதி: \_\_\_\_\_ வயது \_\_\_\_\_ ஆண் / பெண்

3. முகவரி : \_\_\_\_\_

தொலைபேசி : \_\_\_\_\_ அலைபேசி : \_\_\_\_\_

4. குடும்ப நபர்களின் எண்ணிக்கை - 1 / 2 / 3 / 4 / 5

5. குடும்பத்தில் எவருக்கேனும் ஆஸ்துமா இருந்ததா? - ஆம், இல்லை

6. குடும்பத்தில் யாருக்கு ஆஸ்துமா இருந்தது? - தாய் / தந்தை / சகோதரன் / சகோதரி

7. குடும்பத்தில் எவருக்கேனும் அலர்ஜி உண்டா? - ஆம் / இல்லை

ஆம் எனில் விபரம் \_\_\_\_\_

8. சிகரெட் புகையை சுவாசிக்க வாய்ப்பு - ஆம் / இல்லை

9. சமைக்க உபயோகிக்கும் எரிவொருள் - விறகு / மண்ணெண்ணை / கேஸ்

10. பெற்றோர் கல்வி விபரம்

தந்தை \_\_\_\_\_ தொழில் \_\_\_\_\_

தாய் \_\_\_\_\_ தொழில் \_\_\_\_\_

11. மாத வருமானம் \_\_\_\_\_

படிவம் பூர்த்தி செய்தவர் பெயர் \_\_\_\_\_ தேதி \_\_\_\_\_ கையொப்பம்

\_\_\_\_\_

## ANNEXURE 6: ISAAC WRITTEN & VIDEO QUESTIONNAIRE IN TAMIL

### 72. தொகுதி 11 ஊக மூச்சு மற்றும் ஆஸ்துமா கேள்வி படிவம் 12 முதல் 14 வயது வரை உள்ளவர்களுக்கான கேள்விகள்

1. உங்களுக்கு நெஞ்சில் விசில் சத்தம் எப்போதாவது இருந்ததா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>
உங்கள் பதில் "இல்லை" எனில் 6ம் கேள்விக்கு செல்லவும்.		
2. கடந்த 12 மாதங்களில் உங்களுக்கு நெஞ்சில் விசில் சத்தம் இருந்ததா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>
உங்கள் பதில் "இல்லை" எனில் 6ம் கேள்விக்கு செல்லவும்.		
3. கடந்த 12 மாதங்களில் உங்களுக்கு எத்தனை முறை நெஞ்சில் விசில் சத்தம் வந்துள்ளது?	பாதிக்கவில்லை	<input type="checkbox"/>
	1 முதல் 3	<input type="checkbox"/>
	4 முதல் 12	<input type="checkbox"/>
	12 க்கு மேல்	<input type="checkbox"/>
4. கடந்த 12 மாதங்களில் நெஞ்சில் விசில் சத்தத்தினால் தோராயமாக உங்கள் தூக்கம் எத்தனை முறை பாதிக்கப்பட்டது.	நெஞ்சில் விசில் சத்தத்தினால் தூக்கத்தி் ருந்து விழிக்கவில்லை	<input type="checkbox"/>
	குறைந்தது வாரத்திற்கு ஓர் இரவு	<input type="checkbox"/>
	வாரத்தில் ஒன்று (அ) அதிக இரவுகள்	<input type="checkbox"/>
5. கடந்த 12 மாதங்களில் நெஞ்சில் விசில் சத்தம் எப்பொழுதாவது அதிகபடியாகி 2 மூச்சு சுவாசிப்பதற்குள் ஓரிரு வார்த்தைகள் மட்டுமே பேசும் அளவிற்கு பாதித்ததா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>
6. உங்களுக்கு எப்பொழுதாவது ஆஸ்துமா வந்ததா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>
7. கடந்த 12 மாதங்களில் உடற்பயிற்சி செய்யும் போது அல்லது செய்த பிறகு நெஞ்சில் விசில் சத்தம் கேட்டதா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>
8. கடந்த 12 மாதங்களில் உங்களுக்கு மூக்கு சளி (அ) மார்சளி இல்லாத போது இரவில் வரட்டு இருமல் இருந்ததா?	ஆம்	<input type="checkbox"/>
	இல்லை	<input type="checkbox"/>

**7.3. தொகுதி 12 அலர்ஜியினால் ஏற்பட்ட சளி பற்றிய முக்கிய கேள்விகள்**  
**7.3.1. கேள்வி படிவம்**

12 முதல் 14 வயது வரை உள்ளவர்களுக்கான கேள்விகள்  
 அனைத்து கேள்விகளும் சளி (அ) ஃப்ளூ இல்லாத போது ஏற்பட்ட தொல்லைகள் பற்றியது.

- |    |   |       |                          |
|----|---|-------|--------------------------|
| 1. | உங்களுக்கு சளி (அ) ஃப்ளூ இல்லாதபோது<br>தும்மல், மூக்கு ஒழுகல், மூக்கடைப்பு<br>போன்ற தொல்லைகள் எப்பொழுதாவது ஏற்பட்டதா? | ஆம்   | <input type="checkbox"/> |
|    |   | இல்லை | <input type="checkbox"/> |

உங்கள் பதில் "இல்லை" எனில் 6ம் கேள்விக்கு செல்லவும்.

- |    |  |       |                          |
|----|--|-------|--------------------------|
| 2. | கடந்த 12 மாதங்களில் உங்களுக்கு சளி (அ)<br>ஃப்ளூ இல்லாதபோது தும்மல் (அ) மூக்கு ஒழுகல்<br>(அ) மூக்கடைப்பு போன்ற தொல்லைகள் ஏற்பட்டதா? | ஆம்   | <input type="checkbox"/> |
|    |  | இல்லை | <input type="checkbox"/> |

உங்கள் பதில் "இல்லை" எனில் 6ம் கேள்விக்கு செல்லவும்.

- |    |  |       |                          |
|----|--|-------|--------------------------|
| 3. | கடந்த 12 மாதங்களில் மேற்கண்ட<br>தொல்லைகளுடன் கண் நமைச்சல், கண்ணீர் வடிதல்<br>இருந்ததா? | ஆம்   | <input type="checkbox"/> |
|    |  | இல்லை | <input type="checkbox"/> |

4. கடந்த 12 மாதங்களில் எந்த மாதத்தில் மேற்கண்ட மூக்கு  
சம்பந்தப்பட்ட பிரச்சனைகள் இருந்தது.  
(சரியான மாதத்தை டிக் செய்யவும்)

ஜனவரி	<input type="checkbox"/>	மே	<input type="checkbox"/>	செப்டம்பர்	<input type="checkbox"/>
பிப்ரவரி	<input type="checkbox"/>	ஜூன்	<input type="checkbox"/>	அக்டோபர்	<input type="checkbox"/>
மார்ச்	<input type="checkbox"/>	ஜூலை	<input type="checkbox"/>	நவம்பர்	<input type="checkbox"/>
ஏப்ரல்	<input type="checkbox"/>	ஆகஸ்டு	<input type="checkbox"/>	டிசம்பர்	<input type="checkbox"/>

- |    |   |               |                          |
|----|---|---------------|--------------------------|
| 5. | கடந்த 12 மாதங்களில் உங்கள் தினசரி<br>வாழ்க்கையை மேற்கண்ட மூக்கு சம்பந்தப்பட்ட<br>தொல்லைகள் எந்தளவிற்கு பாதித்தது? | பாதிக்கவில்லை | <input type="checkbox"/> |
|    |   | குறைந்தளவு    | <input type="checkbox"/> |
|    |   | ஓரளவு         | <input type="checkbox"/> |
|    |   | நிறைய         | <input type="checkbox"/> |

- |    |  |       |                          |
|----|--|-------|--------------------------|
| 6. | உங்களுக்கு எப்பொழுதாவது<br>டஸ்ட் அலெர்ஜி வந்ததா? | ஆம்   | <input type="checkbox"/> |
|    |  | இல்லை | <input type="checkbox"/> |



7.5. தொகுதி 14 வீடியோ கேள்விகள்  
7.5.1. கேள்வி படிவம்

1. உங்கள் சுவாசம் இதைப்போல் எப்பொழுதாவது இருந்ததா?

- |  |     |                          |       |                          |
|--|-----|--------------------------|-------|--------------------------|
| - உங்கள் வாழ்வில் எப்பொழுதாவது இதைப்போல் இருந்ததா? | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில் : கடந்த வருடமா?                        | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில் : மாதத்திற்கு ஒன்று (அ) நிறைய தடவையா?  | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |

2. உங்கள் சுவாசம் வீடியோவில் காண்பிக்கப்பட்ட உடற்பயிற்சி செய்த சிறுவனுக்கு இருந்ததை போல் எப்பொழுதாவது இருந்ததா?

- |   |     |                          |       |                          |
|---|-----|--------------------------|-------|--------------------------|
| - வாழ்வில் எந்த நேரத்திலாவது?                   | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், கடந்த வருடமா?                      | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், மாதத்திற்கு ஒன்று (அ) நிறை தடவையா? | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |

3. நீங்கள் இதைப்போல் எப்பொழுதாவது இரவில் தூக்கத்தி ருந்து விழித்ததுண்டா?

- |   |     |                          |       |                          |
|---|-----|--------------------------|-------|--------------------------|
| - உங்கள் வாழ்வில் எந்த நேரத்திலாவது?            | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், கடந்த வருடமா?                      | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், மாதத்திற்கு ஒன்று (அ) நிறை தடவையா? | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |

4. நீங்கள் இதைப்போல் எப்பொழுதாவது இரவில் தூக்கத்தி ருந்து விழித்ததுண்டா?

- |   |     |                          |       |                          |
|---|-----|--------------------------|-------|--------------------------|
| - உங்கள் வாழ்வில் எப்பொழுதாவது?                 | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், கடந்த வருடமா?                      | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், மாதத்திற்கு ஒன்று (அ) நிறை தடவையா? | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |

5. உங்கள் சுவாசம் இதைப்போல் எப்பொழுதாவது இருந்ததா?

- |   |     |                          |       |                          |
|---|-----|--------------------------|-------|--------------------------|
| - உங்கள் வாழ்வில் எப்பொழுதாவது இருந்ததா?        | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், கடந்த வருடமா?                      | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |
| - ஆம் எனில், மாதத்திற்கு ஒன்று (அ) நிறை தடவையா? | ஆம் | <input type="checkbox"/> | இல்லை | <input type="checkbox"/> |

## **ANNEXURE 7: SCENES IN ISAAC VIDEO QUESTIONNAIRE**



### **1. Wheeze at rest**



### **2. Exercise induced Wheeze**



### **3. Night Wheeze**



**4. Night cough**



**5. Severe wheeze.**

## ANNEXURE 8: SCORING OF SYMPTOMS OF ASTHMA IN ISAAC

### WRITTEN QUESTIONNAIRE

- Core questionnaire for asthma of the International Study of Asthma and Allergies in Childhood and scores used to calculate the overall score (in parentheses).

1. Has your child ever had wheezing or whistling in the chest at any time in the past?  
( 2 ) Yes    ( 0 ) No
- If you have answered "no" please skip to question 6.
2. Has your child had wheezing or whistling in the chest in the last 12 months?  
( 2 ) Yes    ( 0 ) No
3. How many attacks of wheezing has your child had in the last 12 months?  
None ( 0 )    1 to 3 ( 1 )  
4 to 12 ( 2 )    More than 12 ( 2 )
4. In the last 12 months, how often, on average, has your child's sleep been disturbed due to wheezing?  
Never ( 0 )  
Less than one night per week ( 1 )  
One or more nights per week ( 2 )
5. In the last 12 months, has wheezing ever been severe enough to limit your child's speech to only one or two words at a time between breaths?  
( 1 ) Yes    ( 0 ) No
6. Has your child ever had asthma?  
( 1 ) Yes    ( 0 ) No
7. In the last 12 months, has your child's chest sounded wheezy during or after exercise?  
( 2 ) Yes    ( 0 ) No
8. In the last 12 months, has your child had a dry cough at night, apart from a cough associated with a cold or respiratory infection?  
( 2 ) Yes    ( 0 ) No

*Solé D, Vanna AT, Yamada E, Rizzo MC, Naspitz CK. International Study of Asthma and Allergies in Childhood (ISAAC) written questionnaire: validation of the asthma component among Brazilian children. J Invest Allergol Clin Immunol. 1998;8(6):376-82.*

## **ANNEXURE 9: DATA SHEETS**

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]